

DOINGWHATWORKS



Video

FULL DETAILS AND TRANSCRIPT

Specialist Teachers Provide Practice in Mathematics

Worthington Hooker School, Connecticut • June 2008

Topic: National Math Panel: Critical Foundations for Algebra
Practice: Comprehensive Instruction

Highlights

- How the physical education teacher determines what mathematics skills to work on
- Examples of physical education-math activities, including math tag for fluency practice, ratios and percentages in basketball shooting, perimeter and area of fields
- Structure of a physical education math lesson, including demonstration and introduction, the importance of written documentation, and corrections
- How choral music teacher helps students practice math facts with songs
- How middle grades music teacher connects note values to fractions, including time signatures, notes that get the beat
- Connection students make to fractions using the rhythms of rap music
- Visual arts teacher describes project to help students move between 2D and 3D, building a model and then enlarging it
- How design of origami boxes relate to shapes and determining dimensions
- Relationship between effort in mathematics and practice in art

About the Site

Worthington Hooker School

New Haven, CT

Demographics

45% White

25% Black

22% Asian

7% Hispanic

37% Free or Reduced-Price Lunch

11% English Language Learners

6% Special Education

The Worthington Hooker mathematics program exemplifies the goals of the New Haven School District in holding high expectations for all students and preparing them for STEM career options. The school implements these features:

- Focus on fewer topics at deeper level of understanding;
- Cross-grade units with “significant tasks;”
- Benchmark testing four to seven times a year;
- Extensive focus on number sense and fractions;
- Roles for specialist teachers (physical education, music, visual arts) in providing additional math practice;
- Bi-monthly school level data team meetings; and
- Monthly coaches meetings at a district level to review results of school-level data team meetings.

Full Transcript

Hi, I am Kathy Mirando from Worthington Hooker School. I am a Phys Ed teacher, and I teach grades K through 8. As a Phys Ed teacher in New Haven, I have always done math with the students verbally, but now we are doing it more concrete, more physical, more paperwork so that we can really get down to the nuts and bolts of the students really learning the math concepts, and it helps.

I talk to the teachers during the school year, especially before the Connecticut Mastery Test, and we go over the skills that they need to learn and get to reinforce because for some kids, it works better in Phys Ed. They understand it; it's more concrete. They can work with me, and that helps the math teacher out. I ask them for a book, and I go over it, and I look at what strands they need to work on.

All the teachers in New Haven work with the math supervisor and the classroom teachers on developing

lessons. If we need a lesson for football or basketball, we may go to another teacher to help us out, and we communicate with each other on the lessons that we need.

I start teaching math to the younger kids in grade K. We work on counting, counting backwards, dividing the class into equal players on each team. So they get familiar with using math. In second and third grade, I work with the students on math: multiplication, division, and addition, and I help them with this with their math tag game. During the tag game, my math tag game, there are two students who walk around with these cards and when another student gets tagged, the child walks up to them and shows them the card. They have to answer the card correctly in order to reenter the game, so it helps them with their math facts. For ratios and percentages, I work on a basketball shooting game where they have to figure out the percentage of baskets they make out of ten. And I have an example of their basketball score sheet, which they use, and then it has an example for them so they can figure out the percentage that they made. We work on perimeter and area in the playground with the students. We walk out the perimeter of a soccer field. We multiply the length times the width in steps to figure out the area of our soccer field that we use. When I start a lesson with the students and it's a math lesson, I always explain to them and give them written examples on what they need to know, and I have them go over the examples with me before we start every lesson so they all know what to do, what's expected of them. At the end of the lesson, we all bring our papers together, we go over everyone's results, and if any corrections need to be made, the students help each other out and make their corrections.

My name is Susan Arnold and I teach K through 4 general music or singing at Worthington Hooker School. When students recognize that math and music have a relationship, they are very surprised and pleased, like, it seems you do talk to my real teacher. For instance, when I know that the second and third grade are studying multiplication, I launch into a little multiplication song: "5 times 5 is 25, 5 times 6 is 30." And I don't dwell a lot on it, but it's something that catches on so quickly and they take it back to their class. Another example of how I help students practice math is through note value. For instance, we add the number of beats in a measure or in a song to make sure we have the right number of beats in a measure. We write rhythms with particular number of beats in each rhythm, and I actually start that right in first grade with two beats per measure and really only knowing the quarter note and the eighth notes, having them count them and clock them and move them. I guess as a music teacher, I see it as using math to help promote my subject area, so, I think one does serve the other.

I am Ann Page. I teach fifth through eighth grade general music course and band at Worthington Hooker School. Actually, almost everything I do in my classes is related to math. Music can't be music without math. I start immediately with the fifth grade teaching them note values and an understanding of what the names are related to value, which is equal to beat. In order to know what beat is, they have to have something to associate it with—I associate it with their heartbeat. If they hold their hand on their heart, they can feel that their beat is consistent and equal distance apart. And the more we move, the faster it goes, but it

continues to stay the equal distance apart, and the same thing happens in music.

And, then, I teach them—if they haven't already learned, or review in the cases that have—the values and the names of the notes, and how they relate to fractions, because everything we do in reading or writing music, and writing songs with lyrics, is related to fractions. So I take and I show them my two half notes are equal to two halves of a pie. Then, when I break it down it would be four quarters, and break it down even further, then we have our eighth notes and such. So, I've made just an example, but it all equals one and the one pie equals one measure. The measure is a measure because it measures distance, it measures beats. If you have an equal space, these many beats fit in there. How do we know what beats go in there, how many beats in there? Well, we have what we call a time signature. The time signature is what visually connects them with what they see on their math sheet as compared to just seeing a piece of pie. They have the numerator and they have the denominator, which equals in fractions. We have the four. The top, the numerator, saying "how many of them there are in that measure" is the top number. The bottom number, the denominator, says "what kind of notes get the beat." So there would be four beats in a measure and the quarter note gets the beat.

There is a connection for numerous kids who don't understand fractions. I know for myself, I didn't until I got music. And then once, especially now that we have rap and they want to do everything in that rhyme, you begin to say, "Okay, let's talk about 'I saw a butterfly.' How are we going to do that? We have 1, 2 and 3 and 4." So I would take my pie and we would have the 1, and then maybe the two words, "saw a" "butter-fly," so it would be 1, 2 and 3 and 4, and they go "Wow, that's just like..." and they begin to understand. And it's so much fun when the light does go on because then they go back to their classroom and they go, "I understand that, we did that in music, we did that in band!"

Hi, I am Judy Cavanaugh. I am the K-8 art teacher here at Worthington Hooker School. One thing that I found is that students have difficulty sometimes moving from 2-D to 3-D and back again. And so in order to enhance any work that they might be doing later on with geometric forms, I try to have them work with models so that they can have hands-on experience and see how a two-dimensional drawing might actually look in real life in 3-D. So I like to take them from a smaller model like toothpicks and marshmallows, to a larger sculpture where they did a classroom sculpture, a class sculpture together with using newspapers and have them drawing in between, have them going back and forth between two-dimensional, three-dimensional, and then back again so that they can see how that all works together. The goal was to end up with this class sculpture, and it's in the lobby right now, and it just grew and grew and grew.

So one of the examples that I did this year—in fifth grade we made origami boxes and the students had to figure out how to do the folding part. And so when we folded it in half the first time, I said, "What two shapes did we just make?" and they said, "Oh, two triangles make a square." And then we kept folding and they said, "Oh, we have to fold again." We get four triangles, and so then I said, "Well, that's math"—they found out that four triangles make a square. And then they also had to figure out how they could get the

front of their box—what part of the two-dimensional paper was going to show up on the three-dimensional form, and they had to figure out where the top of their box was going to come out. And so they figured out that it was going to be the middle of their paper and that the other parts of the paper would be the sides and the inside of the origami box. So often kids tell me that they are not good in art and I also hear them saying sometimes that they are not good in math, and what I try to tell them is that art, like math, and math, like art, takes practice and effort.